REMARKS

I. Status of the Claims

Claims 1-18 are pending. Claims 7-18 have been withdrawn from consideration because of a restriction requirement; the Examiner has noted Applicants' request for claim rejoinder. Claims 1-6 remain for consideration.

II. Response to the Rejection under Section 102(e)

Applicants traverse the rejection of claims 1-3 and 5 under 35 U.S.C. § 102(e) as anticipated by Zhou et al. (U.S. Pat. No. 6,534,661), and they respectfully ask the Examiner to reconsider and withdraw the rejection in view of the following remarks.

Zhou teaches a dual-functional catalyst useful for making (1) hydrogen peroxide from hydrogen and oxygen, and (2) propylene oxide from propylene and hydrogen peroxide. The catalyst comprises "noble metal crystallites with dimensions on the nanometer scale . . . specially dispersed on titanium silicalite substrate particles" (see Abstract). Zhou uses a water-soluble ionic polymer such as sodium polyacrylate to help deposit active metal nanoparticles onto the titanium zeolite substrate. "The function of the ionic polymer is to act as a dispersing and control agent to disperse the metal particles on the surface and control their face exposition" (see col. 3, l. 66 to col. 4, l. 1).

Zhou's paragraph bridging columns 5 and 6, when read with Example 1 ("Preparation of the Dual-functional Catalyst"), is helpful for understanding the reference teachings. Zhou begins with an acidic, aqueous solution containing noble metal ions (e.g., Pd^{2+}), then adds another metal salt (e.g., $PtCl_2$). A "water-soluble catalyst impregnation control ionic polymer" (e.g., sodium polyacrylate) is then added. This gives a "mixed solution" that is then reduced (e.g., with hydrogen gas, as in Example 1). Reducing the solution with hydrogen is important because doing so precipitates nanosized Pd^0 and Pt^0 particles from the solution, thereby allowing them to be deposited on the substrate (titanium zeolite)

in the next step. After reduction of the mixed solution with hydrogen, Zhou teaches "adding the particulate catalytic substrate [i.e., titanium zeolite] to the reduced mixed solution and impregnating the substrate *with the noble metal portion* of the reduced mixed solution" (see col. 5, line 66 to col. 6, line 2; emphasis added). A skilled person understands from this text that only "the noble metal portion" of the reduced solution is deposited on the titanium zeolite. The water-soluble acrylate polymer stays, of course, in the water phase. Thus, the polymer is removed along with the rest of the water phase when the aqueous mixture is filtered. The resulting "dual functional" catalyst is a titanium zeolite that is "impregnated" with nanoparticles of Pt and Pd that have a very particular "exposition" of crystal faces.

In contrast, consider Applicants' Example A. TS-1 (3 g) is added to a solution of polystyrene (3 g) in cyclohexane. The mixture is cooled and hexanes are added to force polymer out of solution and around the TS-1 particles. Filtration and washing does not remove the polymer. This is evident from the weight of polymer-encapsulated TS-1 product (5.34 g), about 2.3 g of which is the polystyrene encapsulant.

In sum, the Zhou process does not provide a "polymer-encapsulated" titanium zeolite as contemplated by Applicants because the polymer, which must be water-soluble, stays in the water phase and is separated from the noble metal-impregnated zeolite during its preparation. In view of the above remarks, Applicants respectfully ask the Examiner to reconsider and withdraw the Section 102(e) rejection.

III. <u>Response to the Rejection under Section 103(a)</u>

Applicants traverse the rejection of claim 4 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Zhou and Grey et al. (U.S. Pat. No. 6,194,591), and they respectfully ask the Examiner to reconsider and withdraw the rejection in view of the following remarks.

Applicants do not dispute that titanium beta is a functional equivalent of TS-1 within the context of their invention. However, the combined teachings of

Zhou and Grey would not render the claimed polymer-encapsulated titanium zeolites unpatentable for essentially the same reasons argued above with respect to the Zhou reference. Simply put, Zhou's disclosed process does not produce a "polymer-encapsulated" titanium zeolite. As explained earlier, Zhou's noble metal-impregnated TS-1 does not incorporate a polymer encapsulant. Moreover, a skilled person has no particular incentive to modify Zhou's method in a way that would provide a polymer-encapsulated titanium zeolite. Zhou's requirement of a water-soluble polymer and specific teachings to impregnate the zeolite with "the noble metal portion" of the reduced solution counsels a skilled person away from the idea of making a polymer-encapsulated titanium zeolite. Because Grey also does not teach or suggest to encapsulate titanium zeolites with a polymer, the combined reference teachings fail to make it obvious to do so. The Examiner should therefore reconsider and withdraw the rejection.

IV. Conclusion

In view of the above remarks, Applicants respectfully ask the Examiner to reconsider and withdraw the rejections under Sections 102(e) and 103(a) and pass the case to issue. Applicants invite the Examiner to telephone their attorney at (610) 359-2276 if she believes that a discussion of the application might be helpful.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first-class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, P.O. Box. 1450, Alexandria, VA 22313-1450 on April 15, 2005.

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Respectfully submitted,

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